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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/687,839	10/20/2003	Masao Okihara	MAE 297	9891
23995	7590	03/08/2005	EXAMINER	
RABIN & Berdo, PC 1101 14TH STREET, NW SUITE 500 WASHINGTON, DC 20005			LE, DUNG ANH	
			ART UNIT	PAPER NUMBER
			2818	

DATE MAILED: 03/08/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

AK

Office Action Summary

Application No.

10/687,839

Applicant(s)

OKIHARA, MASAO

Examiner

DUNG A. LE

Art Unit

2818

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-14 and 16 is/are rejected.
- 7) ☒ Claim(s) 15 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 20 October 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date ____ | 6) <input type="checkbox"/> Other: ____ |

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DETAILED ACTION

Oath/Declaration

The oath/declaration filed on 10/20/2003 is acceptable.

Information Disclosure Statement

This office acknowledges of the following items from the Applicant:

Information Disclosure Statement (IDS) filed on **10/20/2003** and made of record.

The references cited on the PTOL 1449 form have been considered.

Specification

The specification has been checked to the extent necessary to determine the presence of all possible minor errors. However, the applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Rejections

Claim Rejections - 35 USC § 112

Claims 1 and 10 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The limitation in abovementioned claims "a certain conductive type" is vague and indefinite. It is not clear which conductive type is desired as a certain conductive type.

The remaining claims are dependent from the above rejected claims and therefore also considered indefinite.

Set of claims 1- 9

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1- 2 and 4- 9 are rejected under 35 USC 102 (e) as being anticipated by Mouli (6670682 B1).

Mouli teaches a method of forming a silicon-on-insulator device, comprising:

defining an active region in a silicon-on-insulator substrate (fig. 2);

doping the entire active region a first time with an impurity of a certain conductive type (P-) (fig. 3 col 7, line 24);

masking 22 a main part of the active region; and
doping peripheral parts of the active region at least a second time 24 and a third time 28 with an impurity of said certain conductive type.

Regarding claim 2, wherein the impurity used the second time or the third time has a higher atomic number than the impurity used the first time (col 8, lines 5 and 35).

Regarding claim 4, wherein the impurity used the first time comprises phosphorus, and the impurity used the second time or the third time comprises antimony (col 7, line 62).

Regarding claim 5, the peripheral parts of the active region are doped the second and third times 24/28 (col 7, line 65 and col 8, line 32) by ion implantation.

Regarding claim 6, wherein mutually different ion implantation energies are used the second time and the third time (col 7, line 65 and col 8, line 32).

Regarding claim 7, wherein the peripheral parts of the active region are doped by ion implantation a fourth time 34 in addition to the second time and the third time, mutually different ion implantation energies being used the second, third, and fourth times.(col 8, lines 25-37).

Regarding claim 8, wherein the silicon-on-insulator substrate is of the fully depleted type (col 3, line 45).

Regarding claim 9, wherein defining the active region comprises local oxidation of silicon 12 (fig. 2).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 3 is rejected under 35 U.S.C. 103 (a) as being unpatentable over Mouli in view of the following remark.

Mouli disclosed the claimed invention as apply to claim 1, except for the impurity used the second time or the third time comprises indium. It would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize indium for the second time or the third time because the indium is commonly used to improve conductivity in the contact region, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use.

Set of claims 10- 16.

Claims 10- 11, 13- 14 are rejected under 35 USC 102 (e) as being anticipated by Mouli (6670682 B1).

Mouli teaches a method of forming a silicon-on-insulator device, comprising:
defining an active region in a silicon-on-insulator substrate (fig. 2);
doping the entire active region with an impurity of a certain conductive type (col 7, lines 20- 25);
masking (fig. 3) a main part of the active region;
implanting ions 24 of said certain conductive type into peripheral parts of the active region with a first average projection range (col 7, line 65 and col 8, lines 10-15);
and
implanting ions 28 of said certain conductive type into the peripheral parts of the active region with a second average projection range different from the first average projection range. (col 7, line 65 and col 8, lines 10-15);

Regarding claim 11, wherein the active region has a maximum thickness permitting full depletion during operation of the silicon-on-insulator device (fig. 5).

Regarding claim 13, wherein the impurity with which the entire active region is doped comprises boron (P-) (fig. 3).

Regarding claim 14, wherein the ions implanted into the peripheral parts of the active region with the first and second average projection ranges are boron difluoride ions. (col 8, line 10).

Claim 12 and 16 rejected under 35 U.S.C. 103 (a) as being unpatentable over Mouli in view of the following remark.

Regarding claim 12, Mouli disclosed the claimed invention as apply to claim 10, but fail to disclose wherein the second average projection range is greater than the first average projection range; the first average projection range is at most thirty nanometers less than the maximum thickness of the active region; and the second average projection range is at most ten nanometers less than the maximum thickness of the active region as cited in claim 12.

However, it would have been obvious to one having ordinary skill in the art making semiconductor device to determine the workable or optimal range for the second average projection range is greater than the first average projection range; the first average projection range is at most thirty nanometers less than the maximum thickness of the active region; and the second average projection range is at most ten nanometers less than the maximum thickness of the active region through routine experimentation and optimization to optimal device performance.

Regarding claim 16, Mouli disclosed the claimed invention as apply to claim 10, but fail to disclose the impurity used the second time or the third time comprises indium as cited in current claim. It would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize indium for the second time or the third time because the indium is commonly used to improve conductivity in the contact region, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use.

Reasons for Indication of Allowable Subject Matter

Claim 15 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims, since the prior made of record and considered pertinent to the applicant's disclosure does not teach or suggest the claimed limitations. –Mouli (U.S. Patent No. 6670682 B1) and Background of Invention taken individually or in combination, do not teach the claimed invention having the step of implantation ions into the peripheral parts of the active region with the first average projection range are boron difluoride ions; and the ions implanted into the peripheral parts of the active region with the second average projection range are indium ions, the second average projection range being greater than the first average projection range.

If Applicants are aware of better art than that which has been cited, they are required to call such to attention of the examiner.

When responding to the office action, Applicants' are advice to provide the examiner with the line numbers and page numbers in the application and/or references cited to assist the examiner to locate the appropriate paragraphs.

A shortened statutory period for response to this action is set to expire 3 (three) months and 0 (zero) day from the day of this letter. Failure to respond within the period for response will cause the application to become abandoned (see M.P.E.P 710.02(b)).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dung A. Le whose telephone number is (571) 272-1784. The examiner can normally be reached on Monday-Tuesday and Thursday 6:00am- 4:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Nelms can be reached on (571) 272-1787. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9306 for regular communications and (703) 872-9306 for After Final communications.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status

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information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

DUNG A. LE
Primary Examiner
Art Unit 2818

A handwritten signature in black ink, appearing to read 'DLe', is positioned to the right of the typed name 'DUNG A. LE'.